AMENDMENTS TO THE CLAIMS

Claims 1-34: (Canceled).

35.   (new) A method for creating a dictionary for video compression, comprising

(a) designating an initial reference dictionary of functions,

(b) designating a set of video sequences to be used as training sequences,

(c) calculating the motion residual image for at least one of the frames of a video sequence from the set of video sequences,

(d) determining an energy threshold for evaluating the residual image,

(e) evaluating the residual image for portions above the energy threshold

(f) comparing a first high energy portion of the residual image to at least one function in the reference dictionary,

(g) extracting the first high energy portion of the residual image,

(i) storing the extracted high energy portion of the residual image,

(j) synthesizing the dictionary from the stored high energy portion of the residual image, in which the step of synthesizing comprises

dividing the extracted high energy portions into at least two subsets based on an inner product calculation, and

calculating an updated dictionary pattern from the elements in the two subsets.

36.   (new) The method of claim 35, in which the step of calculating comprises

$$\hat{x}_{j,n+1} = \frac{\sum_{x_i \in S_{j,n}^{(+)}} \omega_i x_i}{\sum_{x_i \in S_{j,n}^{(+)}} \omega_i} - \frac{\sum_{x_i \in S_{j,n}^{(-)}} \omega_i x_i}{\sum_{x_i \in S_{j,n}^{(-)}} \omega_i}$$

37.   (new) The method of claim 35, further comprising the steps of

(k) revising the residual image, and

(l) repeating steps (f) - (i) for at least a second high energy portion of the residual image, after said first high energy portion has been extracted.

38.   (new) A dictionary for use in video compression, said dictionary generated by

(a) designating an initial reference dictionary of functions,

(b) designating a set of video sequences to be used as training sequences,

(c) calculating the motion residual image for at least one of the frames of a video sequence from the set of video sequences,

(d) determining an energy threshold for evaluating the residual image,

(e) evaluating the residual image for portions above the energy threshold

(f) comparing a first high energy portion of the residual image to at least one function in the reference dictionary,

(g) extracting the first high energy portion of the residual image,

(i) storing the extracted high energy portion of the residual image,

(j) synthesis from the stored high energy portion of the residual image, in which the step of synthesis comprises dividing the extracted high energy portions into at least two subsets based on an inner product calculation, and calculating an updated dictionary pattern from the elements in the two subsets.

39.   (new) The method of claim 38, in which the step of calculating comprises

$$\hat{x}_{j,n+1} = \frac{\sum_{x_i \in S_{j,n}^{(+)}} \omega_i x_i}{\sum_{x_i \in S_{j,n}^{(+)}} \omega_i} - \frac{\sum_{x_i \in S_{j,n}^{(-)}} \omega_i x_i}{\sum_{x_i \in S_{j,n}^{(-)}} \omega_i}$$

40.   (new) The method of claim 38, further comprising the steps of

(k) revising the residual image, and

(l) repeating steps (f) - (i) for at least a second high energy portion of the residual image, after said first high energy portion has been extracted.

41.   (new) A video encoding system containing a dictionary generated by

(a) designating an initial reference dictionary of functions,

(b) designating a set of video sequences to be used as training sequences,

(c) calculating the motion residual image for at least one of the frames of a video sequence from the set of video sequences,

(d) determining an energy threshold for evaluating the residual image,

(e) evaluating the residual image for portions above the energy threshold

(f) comparing a first high energy portion of the residual image to at least one function in the reference dictionary,

(g) extracting the first high energy portion of the residual image,

(i) storing the extracted high energy portion of the residual image,

(j) synthesis from the stored high energy portion of the residual image,
in which the step of synthesis comprises
dividing the extracted high energy portions into at least two subsets based on an inner product calculation, and
calculating an updated dictionary pattern from the elements in the two subsets.

42.   (new) The method of claim 41, in which the step of calculating comprises

$$\hat{\mathbf{x}}_{j,n+1} = \frac{\sum_{\mathbf{x}_i \in S_{j,n}^{(+)}} \omega_i \mathbf{x}_i}{\sum_{\mathbf{x}_i \in S_{j,n}^{(+)}} \omega_i} - \frac{\sum_{\mathbf{x}_i \in S_{j,n}^{(-)}} \omega_i \mathbf{x}_i}{\sum_{\mathbf{x}_i \in S_{j,n}^{(-)}} \omega_i}$$

43. (new) The method of claim 41, further comprising the steps of

(k) revising the residual image, and

(l) repeating steps (f) - (i) for at least a second high energy portion of the residual image, after said first high energy portion has been extracted.

44. (new) A machine readable medium, upon which are stored instructions to generate a dictionary for video compression according to the method comprising steps of

(a) designating an initial reference dictionary of functions,

(b) designating a set of video sequences to be used as training sequences,

(c) calculating the motion residual image for at least one of the frames of a video sequence from the set of video sequences,

(d) determining an energy threshold for evaluating the residual image,

(e) evaluating the residual image for portions above the energy threshold

(f) comparing a first high energy portion of the residual image to at least one function in the reference dictionary,

(g) extracting the first high energy portion of the residual image,

(i) storing the extracted high energy portion of the residual image,

(j) synthesis from the stored high energy portion of the residual image,

in which the step of synthesis comprises

dividing the extracted high energy portions into at least two subsets based on an

inner product calculation, and

calculating an updated dictionary pattern from the elements in the two subsets.

45.   (new) The method of claim 44, in which the step of calculating comprises

$$\hat{X}_{j,n+1} = \frac{\sum_{x_i \in S_{j,n}^{(+)}} \omega_i X_i}{\sum_{x_i \in S_{j,n}^{(+)}} \omega_i} - \frac{\sum_{x_i \in S_{j,n}^{(-)}} \omega_i X_i}{\sum_{x_i \in S_{j,n}^{(-)}} \omega_i}$$

46.   (new) The method of claim 44, further comprising the steps of

(k) revising the residual image, and

(l) repeating steps (f) - (i) for at least a second high energy portion of the residual image, after said first high energy portion has been extracted.